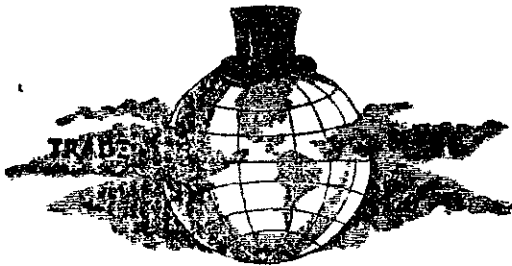


HATTERS,

English and American

SILK DRESS HATS,
OPERA CRUSH HATS,
FELT and CLOTH HATS
In Choice Shades.



FURRIERS.

LEATHER HAT CASES,
CANES, UMBRELLAS,
and WALKING STICKS
Variety Unsurpassed
For STUDENTS' WEAR.

Agents for Heath's, White's, and Lincoln, Bennett & Co.'s ENGLISH HATS.

COLLINS & FAIRBANKS, Successors to
D. P. ILSLEY & CO.,
No. 381 Washington Street, Opposite Franklin, Boston.

JAMES NOTMAN,

Photographer to Class of '85, Institute of Technology, and Harvard '80, '81, and '85.

Boston Studio, 99 BOYLSTON ST., Opp. Public Garden.

Harvard Studio, 400 HARVARD STREET, CAMBRIDGE.

RICHARD L. GAY COMPANY,

(RICHARD L. GAY, late of WARD & GAY,)

Will be pleased to see you at their

NEW RETAIL STORE,

332 Washington Street, - - - BOSTON,

Next Store South Transcript Building,

Where they offer the same complete assortment of goods with all the variety and special features of the old firm of WARD & GAY.

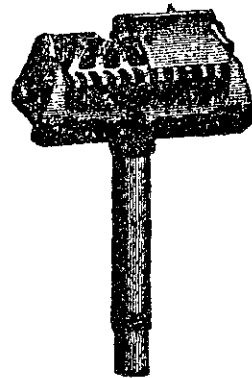
Paper by the Pound, Visiting Cards, Monogram, Crest, and Initial Engraving and Stamping.

They will soon open their Christmas Cards and Souvenirs, which will exceed anything heretofore shown.

✂ Their new sample book of Papers and Envelopes sent upon application.

THE STAR SAFETY RAZOR

SELLING AGENTS,
Dana, Stoddard & Kendall,
Successors to Bradford & Anthony,
374 Washington St., Boston
Opposite Bromfield.



DEALERS IN
CUTLERY,
FANCY HARDWARE,
AND
FISHING TACKLE.

Requires no practice. Every man his own barber.

DERBYS. ——— SILK HATS.

BENT & BUSH,

Military Furnishers to the Institute,

387 WASHINGTON ST., BOSTON.

———— FURS. ———

••• THE •••

Massachusetts Institute of Technology,

BOYLSTON STREET, BOSTON.

FRANCIS A. WALKER, President.

THIS school is devoted to the teaching of science, as applied to the various engineering professions; viz., civil, mechanical, mining, and electrical engineering, as well as to architecture, chemistry, metallurgy, physics, and natural history.

Besides the above distinctly professional courses, the Institute offers scientific courses of a less technical character, designed to give students a preparation for business callings. A four years' course in biology, chemistry, and physics has been established, as preparatory to the professional study of medicine.

Modern languages are taught, so far as is needed for the ready and accurate reading of scientific works and periodicals, and may be further pursued as a means of general training.

The constitutional and political history of England and the United States, political economy, and international law are taught, in a measure, to the students of all regular courses, and may be further pursued as optional studies.

Applicants for admission to the Institute are examined in English grammar, geography, French, arithmetic, algebra, modern history, and geometry. A fuller statement of the requirements for admission will be found in the catalogue, which will be sent, without charge, on application.

A clear admission paper from any college of recognized character will be accepted as evidence of preparation, in place of an examination.

Graduates of colleges conferring degrees, who have the necessary qualifications for entering the third-year class in any of the regular courses of the Institute, will be so admitted, provisionally, on the presentation of their diplomas, and will be given opportunity to make up all deficiencies in professional subjects.

The feature of instruction which has been most largely developed in the school is laboratory training, shop-work, and field-practice, to supplement, to illustrate, and to emphasize the instruction of the recitation and lecture room.

Surveying-instruments are provided for field-work in civil and topographical engineering. Extensive shops have been fitted up for the use of both hand and machine tools, and a laboratory of steam engineering has been established as a part of the instruction in mechanical engineering. Several steam-boilers and steam-engines of various types are available for experiments and tests, as well as a large amount of special apparatus for measuring power, for gauging the flow of water, for tests of belting, etc. The laboratory of applied mechanics contains two testing-machines,—one for ascertaining transverse strength, the other for tension and compression,—besides apparatus for time-tests on timber, for tests of mortars and cements, for tests of shafting, etc. The department of mining engineering and metallurgy has the use of laboratories in which the milling and smelting of lead, copper, silver, and other ores, in economic quantities, are regularly performed by the students themselves. The classes in architecture supplement the work of the drawing and designing rooms by the examination of structures completed or in course of erection, and by practical experiment in the laboratory of applied mechanics, testing the strength of materials and working out problems in construction. The Kidder Chemical Laboratories consist of a laboratory for general chemistry (288 places); a laboratory for analytical chemistry (108 places), together with a special room for volumetric analysis (20 places) and a balance-room with 22 balances; a laboratory for organic chemistry (30 places); a laboratory for sanitary chemistry (16 places); a laboratory for industrial chemistry (16 places); two convenient lecture-rooms; and a well-supplied library and reading-room. The laboratories are thoroughly equipped for the purposes of ordinary instruction, and they also possess excellent facilities for the promotion of original research. The Rogers Laboratory of Physics, the first laboratory in which instruction was systematically given to classes by means of elementary physical measurements conducted by the students themselves, is well provided with the needful facilities for laboratory instruction in both elementary and advanced technical physics, especially in the different branches of electrical engineering.

On the successful completion of any one of the four-year courses of the Institute, the degree of "Bachelor of Science" will be conferred. The degrees of "Master of Science," "Ph.D.," and "Doctor of Science" are open to persons pursuing advanced studies and conducting original researches. Special students are allowed to enter special divisions of any of the courses, on giving evidence that they are prepared to pursue with advantage the studies selected.

The fee for tuition is \$200 a year. Besides this, \$25 or \$30 are needed for books and instruments. There are no separate laboratory fees; only payment for articles broken is required.

For information, address JAS. P. MUNROE, Secretary.

PREPARATION FOR THE INSTITUTE OF TECHNOLOGY.



259 BOYLSTON STREET.

Wm. H. Ladd.

M. Grant Daniell.

REFERENCE

Is made to the President and Faculty of the Institute in regard to the thoroughness with which pupils are fitted at

**CHAUNCY-HALL SCHOOL,
BOSTON,**

not only for passing the entrance examinations, but also for pursuing successfully their subsequent work.

FITTING
for the Institute has long been a specialty at Chauncy Hall. Thorough preparation is made also for **Business and College.**

J. B. McALOON & CO.

~Tailors~

Latest Styles.

First-Class Work.

SPECIAL PRICES

TO STUDENTS.

BOWDOIN SQUARE.

EVERY STUDENT

Of Engineering should be a regular reader of the

AMERICAN MACHINIST.

Largest paid circulation of any strictly Mechanical Newspaper in the world.

PUBLISHED WEEKLY. SUBSCRIPTION PRICE, \$2.50 A YEAR.

AMERICAN MACHINIST PUBLISHING COMPANY,

96 FULTON ST., NEW YORK.

CAFÉ WAQUOIT,

249 Columbus Avenue.

SPECIAL RATES FOR STUDENTS.

21 Meal Ticket, \$4.00.

Lunch Ticket, \$1.25.

SIX O'CLOCK DINNERS.

Evening Lunches from 9 until 11.30 P. M., 25 cents.

Cold Meats, Sandwiches, Sardines, Lamb, Tongues, Pretzels, Saratoga Chips, Bologna Sausage, Baked Beans, Pie, and Crackers and Cheese.

BOSTON & PROVIDENCE R. R.

—CAFE—

PARK SQUARE AND COLUMBUS AVE.

EUROPEAN PLAN.

Open from 6 A. M. to 11.15 P. M.

☞ Six Dollar Students' Tickets, \$5.00.

J. G. COOPER, PROPRIETOR.

OLD COINS AND STAMPS WANTED.

Send 10-cent Postage-Stamp for Coin Catalogue, giving all the rare dates and the prices we pay for them, to

JOHN C. SCHAYER, 147 Devonshire St., Boston, Mass.

Dealer in American and Foreign Coins and Medals, Confederate, Continental, and Colonial Notes, and U. S. Currency, Autographs, Old Newspapers, Relics, and Curios.

No letters of inquiry answered without stamp for reply.

GEORGE L. LANSING,

Thorough Instructor on Banjo and Mandolin.

Agent for the
Celebrated



S. S. Stewart
Banjo.

TREMONT TEMPLE ROOM 9.



The Tech.

VOL. VI.

BOSTON, JANUARY 13, 1887.

NO. 7.

THE TECH.

Published on alternate Thursdays, during the school year, by the students of the Massachusetts Institute of Technology.

BOARD OF DIRECTORS, 1886-87.

T. W. SPRAGUE, '87, <i>Pres.</i>	H. C. SPAULDING, '87.
G. C. DEMPSEY, '88, <i>Sec.</i>	FRANKLIN W. HOBBS, '89.
W. L. DEARBORN, '88, <i>Treas.</i>	J. H. TOWNE, '90.

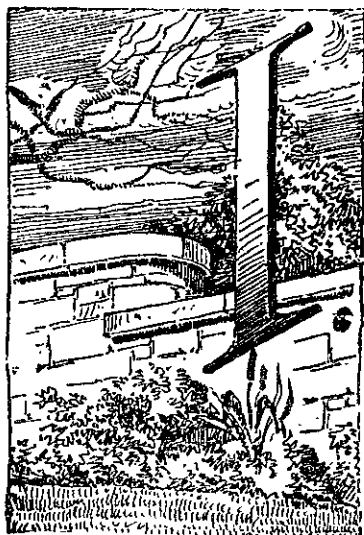
EDITORS.

SYDNEY WARREN, '88, <i>Editor-in-Chief.</i>	
GEO. O. DRAPER, '87.	JAS. T. GREELEY, '88.
QUINTARD PETERS, '87.	J. LAWRENCE MAURAN, '89.
H. G. GROSS, '88.	G. C. WALES, '89.
	, '90.

H. C. SPAULDING, *Advertising Agent.*

Subscription, \$2.00 per year, in advance. Single copies, 15 cts. each.

FRANK WOOD, PRINTER, 352 WASHINGTON STREET, BOSTON.



It is about this time of the year when the work on THE TECH gets to be especially burdensome. Subjects for editorials are few and far between, and it is only after diligent search that they can be found at all. All college news is of a quiet character, and nothing especially interesting is going on.

There are perhaps two things, though, which are scarcer than editorial subjects, and they are contributions from the students and the literary articles in the editor's drawer. It has always been the misfortune of the editors of this paper to have to write nearly all their literary articles themselves, but this year is, perhaps, the most unfortunate year of all. So far, only one contribution of any considerable merit has been received, and competition for places on the editorial board is absolutely at a standstill. It is manifestly unfair to the editors to make them do all the literary work, besides the work necessary for the editing of the paper. Surely, in

such a large institution as the Tech, there must be plenty of men who can write; and if each one of these would only write *one* short article, he would confer an everlasting favor upon the over-worked editors.

Every one is of course now occupied in grinding for the exams., and so can scarcely be expected to send in any contributions. Let them remember, though, that there is a week of rest coming, when they will have time to write something if they only will.

It comes hard, though, to the tired editor, not only to toil upon his own examinations, but to have to grub around for the wherewithal to give hope to the weary, and to make the Freshman laugh, even in spite of the pain and natural timidity with which the first "weeding out" inspires him.

We have done our best under the circumstances. We can surely do no more, and therefore offering no apology, we greet you all, in this time of common anxiety, with the hope that we may all pull through safely, with plenty of H's and C's to make our vacation a pleasant one.

JUST about this time the Techs are unanimously engaged in a pursuit which may be loosely defined as a spasmodic attempt to make up for lost time. This time may have been lost through negligence, natural incapacity, or excessive study—of which the first, whether culpable or not, is simple in its effects; the second no less so, since it prevents his victim from employing his time to the best advantage; the third acts on the principle of "the limit of production," in agricultural economy—that is, beyond a certain point, additional time spent in intellectual effort will not produce adequate returns; such being the case whenever study-

hours habitually infringe on the time necessary for sleep and exercise.

As THE TECH has said before, "cramming" is almost universally considered by people who do not have it to do, as not only injurious to the health, but also as an illegitimate method of gaining a good standing. The poor student never gets any sympathy from those at home, during examination-time. On the contrary, he is goaded to exasperation by remarks from every one that they see no reason why he need be obliged to study so excessively before the examinations, if he had given the proper attention to the subject when he first went over it. And other remarks of a like pleasing nature console him in his hour of trial. This seems to be the popular impression of those who do not know anything about it.

To any one at all familiar with our work here at the Institute, it will be easily comprehended that it is next to impossible for any one here to study so hard during the term, that he will feel perfectly sure on going into an examination, that he has mastered the whole subject. There are always numberless small points which every man feels that he would like to look over — formulæ which have somehow or other completely slipped his memory, or certain points which were brought up at a lecture at which he was unavoidably absent. And so on we could enumerate many more, but every one is only too familiar with them all.

Our Faculty fully appreciate this necessity of looking up small facts, and have shown it by the arrangement of the examinations, there being, whenever possible, a day or so before each of the hardest exams.

The objection that "cramming" is injurious to the health, is, we think, a small one. No one with a reasonably strong constitution was ever injured permanently by "cramming;" at the worst, a slight headache is all that is incurred.

The best argument in its favor, and one which we think more than counterbalances all the arguments against "cramming," is the practice it gives a man in absorbing a great deal in a short time. Of course it may be said that

what is easily learned is easily forgotten, but, at the same time, we do not think this true. It is not easily learned, however quickly it may be done; and it is more than probable that the time will occur sometime in a man's life when his old college habit of learning a good deal in a short time, will stand him in good stead.

AT the commencement of our school year there was a report circulated, founded on good authority, that negotiations were pending for the purchase or rental of Winslow's Skating-rink, for use as a gymnasium. We understand that nothing could be done this year, as Mr. Winslow wished to retain it for purposes of his own, for another season at least. It is hoped that next year we shall be more fortunate, and possess a fine, well-appointed gymnasium when the vacation is over. Some of us would rather that something were done to secure athletic grounds first; but if the corporation has different ideas, we will nevertheless gladly accept the gym. as a compromise. Our present building is scarcely used at all for regular training. Before the athletic games there is some exercise taken there, but its use as a drill-hall is the only one which can be termed in any degree successful. In former years, when it occupied the ground upon which the Kidder building now stands, it was much better equipped, and its convenience made it very desirable. It may be argued that it could be changed over so as to be more in keeping with the present ideas, but a visit to any of the modern structures at our surrounding colleges will convince one of the impossibility of satisfactorily accomplishing such an alteration. Our gym. is too low, poorly lighted, and badly arranged. The Winslow rink is a large, well-built building of very convenient distance from the Tech., which by a few changes would make an admirable gymnasium. The result of our present poor accommodations is, that those who wish systematic exercise join the Association Gym., which has the advantage of nearness, good ap-

pointments, etc., and thereby incur an expense which should not be necessary.

We are aware that the corporation is well disposed toward us, their great trouble being lack of funds; but the next donation should be applied for our physical, instead of our mental, culture. The latter has received attention at the expense of the former in past years; but it is becoming absolutely necessary now for both to be treated with nearly equal consideration. We must remember that we have bodies as well as brains, and both should be cultivated simultaneously, neither at the expense of the other.

THE system of marking examinations at the Institute is a very mysterious and awe inspiring subject to deal with, as may be verified by any student who has undergone the ordeals of our "semmies" or "annuals." The utmost secrecy prevails as to the methods in use, any information being practicably unobtainable. When we receive our reports, with their list of honors, passes, etc., with an explanation (?) of the hieroglyphics thoughtfully printed on the back, we are often as much in doubt as to our real standing as we were before receiving them. What do these terms actually signify? What is the real value of our work? We know not whether a credit signifies between eighty and ninety per cent, or between seventy and eighty. A pass may mean over forty per cent, or over sixty; probably the latter. What we want is an exact statement of our standing, preferably given in per cents, the standing in examinations and recitations being given separately. As it now stands, a credit may mean any per cent between certain limits; and a pass which failed by one per cent of being a credit, shows for no more than if it escaped by one per cent of being a failure. How can we tell in which system we are deficient, examinations or recitations, when the results from both are bunched together?

Another important subject which is vaguely treated in the catalogue and reports, is the rank necessary for the continuation of studies, and

graduation. Except in the case of the Freshman class, there is an imperfect understanding as to the way in which this is settled. Any one who imagines that a pass indicates sufficient knowledge, and that credits and honors are prizes for extra endeavors, is sadly mistaken. In many subjects credits are indispensable, though the student may not realize the fact until graduation.

It seems to us that if the present system cannot be changed for reasons that we may have overlooked or been ignorant of, at least we should have it explained. This idea of keeping us in ignorance of the laws which govern us here, is far from being progressive, or consistent with the train of thought encouraged here. We are certainly old enough to have an insight into affairs which so vitally concern us, and probably have sufficient comprehension to understand them. The Institute should not be so conservative as to interfere with its own interests, which are primarily the interests of the students.

SHORTLY after the announcement in the daily papers that a hundred thousand dollars had been left to the Institute, a bulletin was posted in the analytic laboratory headed, "A Few Things We Would Like With That \$100,000," which enumerated a few things which were needed in the chemical laboratory. Although the whole thing was written in a bantering spirit, and was not intended to do anything but create a little amusement, it nevertheless contained a great deal of truth; and it is to be hoped that now that the corporation has a little money at its disposal, that it will use it, not only to supply necessities in the chemical laboratory, but also in all the other laboratories and rooms in the Institute, wherever anything is especially desired.

It is very annoying when one wishes to make some analysis in the chemical laboratory which requires the use of a platinum dish, to find that there are none obtainable, the few belonging to the laboratory being all out, in use. It not

only is an annoyance but a serious inconvenience, as it greatly retards a man in his work. And this is not a rare occurrence but one which happens every day, and for which the only remedy is more platinum dishes.

We feel sure that something will soon be done about this. Indeed, steps have already been taken in this direction.

THERE is one thing which we have noticed this year which gives us a great deal of pleasure. We mean by this the readiness with which any plans we have proposed or suggested in THE TECH, have been seized on and carried out. We might refer to the '89, '90 foot-ball game, the Tech quarterly, class colors, etc., but the particular thing we are now thinking of is the formation of the book exchange, about which more will be seen in another column. THE TECH feels very proud that it has promoted a scheme that will undoubtedly prove of such an immense advantage to the students of the Institute; the more so, as we believe, that we are the first institution in the country to have adopted such a plan. Our Co-operative Society, recognizing the value of any such an affair as the book exchange to the Institute, has carefully considered the whole matter, and the result has been that next term we will derive all the benefits which can come from such an institution.

As we have said above, if we are not mistaken, no other college yet has such a book exchange, but it is a thing which they cannot well fail to see the advantages of, and which they will do well to follow our example in forming.

Great credit is due to the directors of the Co-operative Society for their energy in taking up this plan and pushing it through in time for next term. Indeed, the Techs may well congratulate themselves that their interests are so carefully looked after by those whom they have elected to do so.

Gaudeamus Igitur.

Won! O months of repressed emotion,
Patience and hope, you were not in vain;
For the hand that penned that cold dismissal
Lies subdued in my own again.
And the lips which said, "I *did* once love you;
Pardon—I own it—my fickleness;
But mine is a heart forever changing,"—
Meet my own in a soft caress.

Hail, New Year! Though your clouds are leaden,
Silver linings they turn to me;
For my harrowing doubts are ended,
And at last my soul is free.
Priceless is the gift you have brought me;
Long, I trust, may be its stay:
Yet for the joy that is, I thank thee,
Though it tarry but a day.

Dear! now more my beloved than ever,
Sad was our parting, and hard to bear;
But while your heart was not another's,
How could I, loving you, ever despair?
Ever forget the cup I had tasted,
Banish the longing to taste once more
Joy so ambrosial, celestial, immortal,
Though but one sip,—and the transport were o'er?

"Fickle," you call yourself; when did a faith,
Swayed by mere impulse and idle caprice,
Ever return in one short season's space
Back to the bonds whence it first sought release?
And what if you were,—am I then so true,
So upright, so perfect, that I should require
A constancy ardent, immaculate, clear
As globule of silver refined in the fire?

He is a coward who weakly refuses
Aught that is good which the gods may provide,
Cravenly fearing lest future disaster
Ravish his treasure, and humble his pride.
Doubt may be conquered, and hope is eternal;
Ours is the present—why then let us cry,
"Drink and be merry, the morrow is changeless,
And when it cometh, at worst we can die?"

JAN. 1, 1887.

A Student's Letter.

[DEAR TECH: The inclosed is a letter from my chum to his father, which I came across the other day lying on the table in his room. Poor fellow! he got a good deal used up after making that night of it. Thinking it might serve as a warning to those who remain behind after hours to draw, I now send you a copy of it.]

MY DEAR FATHER: I have to write you to-day of one of the most horrible nights that I have ever passed through. My tale of woe would be sufficient to wring tears from a

member of the Faculty. I have been getting rather behindhand in my drawing for some time, and so set to last Thursday afternoon with the determination of finishing all drawings up to the present time.

I had been working pretty steadily all the afternoon, and kept on after all the other students had left the drawing-room. Presently, however, after I had finished one plate, spilt my ink over it, thrown the mucilage into my lap, and gone through with all the other performances that seem to belong to drawing, I noticed that it was growing dark; and on consulting a clock on a neighboring church, I found it was half-past eleven. The clock was on a Unitarian church, and I relied on its accuracy. I have since discovered, however, that it had run down.

I quickly packed up my instruments and started off, but on reaching the door of the drawing-room found it, to my surprise and terror, locked.

My first idea was to yell; and I had arranged my mouth for the purpose, when my eye happened to light on a placard, "*Loud Conversation not allowed*," which was tacked up in the drawing-room. I refrained from shouting. If conversation was not allowed, a fellow might as well make the arrangements for his funeral, if he went so far as to shout in the drawing-room. I tried in vain to climb over the door, and also tried to attract the attention of some one to help me. So here I was, booked to spend the night alone in the Institute. I soon began to grow hungry, ravenous, voracious, and mechanically fell to chewing at some of the books which I held in my hand. A little German book was the first, which seemed tolerably palatable. However, it was not substantial enough for a square meal, so I tried a little Taylor's Calculus. This was plenty substantial enough, but it lacked seasoning; so I put it down when I had a mouthful of the "volume generated by the revolution of an ellipse on its semi-major axis." The notes on heat were tasted next. I didn't take but one mouthful, though, and I was obliged to eject that. Our

professor in heat told us to take our notes and "digest them thoroughly"; but I don't think I shall try it any more. I think it would take the crushing-machine in the mining laboratory to do thorough justice to them. I made one more effort, and tried a light *entrée* of Literature. This lasted for some time; but it gave me a violent colic.

Having eaten all I wanted of this heavy repast, I thought I would rather sleep the rest of the night; and so I arranged myself as comfortably as possible, and commenced reading my Applied Mechanics by the light of the moon which shone through the windows. A short time only could have passed before I was wrapped in the arms of Morpheus. I wished afterward that I had stayed awake, as the effect of my supper was a frightful old nightmare. I dreamt that I was chemical molecule, and had found my affinity with a beastly molecule of sulphuretted hydrogen, and could not get away; and also that I was a great hose, and that all the professors were working furiously at an immense fire-engine, pumping something into me from a great vat labelled "Education;" and they pumped so hard that they bursted the hose, and all shouted, "Drop that one; stick on another,—we'll educate 'em!"

I had scarcely recovered from these horrible experiences when a gaudy-looking demon, with a red-hot pair of pants and overcoat on, escorted me by the ear to a room where, in solemn assembly, were gathered the Faculty. It was a secret midnight session of that august body. As we entered, they were in the heat of a discussion as to the propriety of setting the clock in the hall right; but on seeing me, they all shouted, "A Junior in our secret conclave! He must never leave it alive!" And then various scientific methods were suggested of disposing of me. One person, half of whose body was the color of red, and the other half the color of blue litmus, said he would like to make a good nitro-hydrochloric acid solution of Juniors, in order that he might analyze it. Another screamed, "Let me reduce him in the reverberatory furnace"; at which another one, with blue

and red litmus legs, exclaimed, "Steady, there! let me reduce him to the ranks, that he may know who are his superiors." Another wanted my skeleton, for lecture purposes. And so nearly every one had some professional manner of extermination. There was one, however, who did not seem to have taken any share in the confusion, but was soliloquizing, and trying to get some one into a discussion. I could catch now and then a word or two, such as "concept of an absolute existency of the universal horseitude,"—"and aboriginally inherent in." I did not attempt to follow him, however. Suddenly I heard a voice saying, "Certainly, gentlemen, certainly; the affair will be conducted to the entire satisfaction of everybody, I have no doubt; but, gentlemen, the discipline of the Institute must be maintained." At this each one flew at me, determined to "do" me in his particular fashion; and I awoke, finding myself on my head in the sink, with my mouth full of soap, and trying in vain to shove one leg up the hydrant, while the other was waving in the air; and an admiring and enthusiastic party of students were gathered around, making various impolite remarks about me, asking where I had found the material for such a spree in the Institute? and why I had begun so early to cram for the semies, etc.

The night was over, at last, and I climbed out of there pretty soon, I tell you. But it tires one to go through such a night again, and probably will tire you to read about it.

Aff.,

YOUR SON.

The Mustang.

THE mustang is a mustang wherever one finds him—here, or there, or anywhere.

He does not cease to be a mustang when he is brought within the grasp of civilization, for refining influences cannot change the pose or color of his eye.

But the true home of the mustang is west of the Missouri; there it is we find him in his perfection, with his "bucking" powers most

strongly developed. The bunch grass and buffalo grass of this region produce their exhilarating effects upon him, and his soul tends toward contortions when merely a fly lights on his back.

The mustang is not always known by that name; it is strictly applied to him only when his color is black, brown, or dark bay; if his coat is roan or light sorrel we call him "cayuse," though the mustang is sometimes called by that name if he is particularly mean, despite his not having the cayuse color. A gray or white specimen is known as the "broncho"; while the variegated, calico colored, spotted beast is a "pinto."

These horses are used mostly for saddle animals, as they have, as a rule, an easy gait, and are comparatively small. Except in cities the broncho is not shod, for his hoofs are tough, and it is no easy matter to shoe him. If the blacksmith attempts it without first throwing him, he is apt to find himself unexpectedly in some other part of the shop. My PET, "Gruger," was a terror to blacksmiths, and I never was able to find one who could so much as trim his hind hoofs.

To feel at all comfortable on a mustang, the rider must be in a Mexican saddle, with a pair of spurs on his heels, and in his hands reins that lead to a Spanish bit, or a harsh curb. The spurs are particularly necessary if anything of a pace is wanted. The saddling of the mustang is not the easiest part of owning him, for one often finds the saddle too loose for safety after riding a few moments, although it seemed almost painfully tight at the start. The cayuse can swell out like a rubber pillow when he expects to be "sinched," and contracts when that operation is over. But this can be overcome by giving the beast a thump in the ribs with the knee, so unexpected a shock causing him to forget for the instant that he is being sinched.

All through the West there are extensive sheep and cattle ranges, where horses are used largely for herding the stock; and it is on these ranges that large bands of mustangs roam in a

half-wild state. When any of the riding animals become used up, an inroad is made upon the band of unbroken cayuses. The animals chosen are driven first into a small field inclosed by a high fence, where they can be lassoed at will, and whence they are taken one at a time into the "corral," where the breaking is done. The corral is a circular inclosure, built of unhewn logs, and about sixty feet in diameter, in the center of which stands the "snubbing-post." This is usually an oak stake six or more inches thick, driven deeply into the ground, and having a height of four feet or thereabouts. The mustang, after considerable fuss, is tied close to the post, and a blind put over his eyes. A bridle with a harsh bit is first put on, and then the heavy saddle is securely fastened by means of two sinches, each about six inches wide, and made of braided horse-hair. The rider mounts, the lariat is loosened, and when all is ready the blind is removed. The untamed animal stands shaking and dazed,—but for a moment only. With a mighty effort he leaps into the air, almost turns a somersault, and comes back to earth stiff-legged, and with rounded back. With the next bound he is in another part of the corral, and thus he "bucks" incessantly for half an hour, snorting and twisting, till, completely tired out, he ceases, and is a good mustang ever afterward. Sweating, panting, and trembling in every muscle, he follows his conqueror into the barn, and when sufficiently cooled, he is given a feed of oats. These are entirely new to the mustang, who snuffs at them timidly before he tastes them; but from the first mouthful he likes them, and soon forgets the sting of defeat in their delicious qualities.

It is very essential that the mustang shall not throw his first rider, for he will be likely to "buck" again when opportunity offers. I have in mind now a cayuse whose eyes have seen the light for more than a quarter of a century, and which has bucked every time she has been mounted since the day when she was broken, at the age of four years. Her life has been threatened time and time again, but the old lady

does not mind that in the least, and continues to buck if she is tied up for ten minutes and again mounted. Any cayuse can be made to buck if one knows how, but, as a rule, these performances are not invited. One mustang whose acquaintance I made on a three days' journey could be made to buck by pinching his back-bone just behind the saddle; but he never bucked while I rode him.

One of my favorite rides before my college life began was to the home of a friend of my own age, who lived several miles out in the country, and it was my habit to spend every Saturday hunting or fishing near his home. One morning during the middle of summer I was riding toward my friend's house, when on suddenly turning a bend in the dusty road, I saw a boy leading a horse and limping along slowly. I urged my horse into a brisk canter, and as I drew nearer I recognized my friend, and shouted to him. He presented such a ridiculous sight that soberness was out of the question. He was leading an innocent-looking nag, and was covered completely with dust, face, hair, and everything; and a more dejected specimen was never seen. On being asked what the matter was, he spat for a time, rubbing the dust out of his mouth, and then told me how he came in such a plight. He had saddled the beast to go to look at some traps he had set for mink, but he had not been gone long when the mustang took the bit in its mouth and began to run for dear life. Suddenly she stopped, planting her fore feet firmly. But not so with the rider; he kept on for several feet, rolling in the dust, which was a foot deep there, and accumulating it about him in layers. He didn't tell me what he said when he picked himself up, but he concluded to walk home, letting the traps wait a few days longer.

Two friends who were out camping killed four deer one morning, and having their horses with them determined to put the hind-quarters of the deer on the horses. Accordingly, four hams were fastened together, and a gray broncho was brought up. The deer were put on him all right, and were quite tightly fastened, the

horse not taking much interest in what they were doing, but feeding in the bunch grass, which was waist-high everywhere. The broncho, however, after a little time, became conscious that something was wrong, and began snorting. Turning his head, he got a good smell of the deer on his back, and then the circus began. Snorting and jumping, the beast flew around, scattering dirt and pebbles everywhere, while the hunters sat on a knoll, holding a rope fifty feet long tied to the broncho's neck. The tremendous bucking soon loosened the hams, and they began to take all sorts of positions; but finally the last knot gave way, and the deer rolled off, receiving two parting kicks before they reached the ground. A like performance was expected from the other cayuse; but he was not disturbed in the least by the character of his load, and carried it safely to camp.

Nearly all mustangs are hard to catch when they are running loose in a large pasture. When one has them securely, they are as docile as possible; but they are not docile till one gets them where they can't escape. I remember following a cayuse all one afternoon, trying to catch him. I offered him with one hand, hay, salt, barley and oats; and though he was willing enough to eat these, the moment my other hand was stretched out he was off. Not willing to own defeat, I concluded to follow him, and at a slow pace I dogged him wherever he went, till after three hours of this maneuvering he allowed me to approach and put on his halter.

I watched a gang trying to catch a long-legged pinto, one day, and it certainly was amusing to watch the animal's actions. If any of the party tried to get near him, he would stick his tail straight up into the air and run past them like a locomotive; if they attempted to surround him, he dashed through their ranks regardless. Indeed, the pinto had a wide reputation for his fondness of freedom, and the only way he could be caught was by being lassoed; a thing not easily done, for he could run faster than most horses.

The mustang, however, is not all meanness;

he has his good qualities as well as his bad ones, and at his worst is but a child in comparison with a mule. At the same time he is patient and faithful, sturdy and enduring. He is cheap, seldom costing fifty dollars; and he is small, so that one does not get hurt if he tumbles off. The mustang is not the animal of civilization, and the pure-blooded mustang is not so easily found as formerly.

Crosses with finer-blooded horses have changed him considerably, more particularly the gait, which, short and easy in the native, becomes longer and harder by the crossing.

My First Day's Shooting.

WHO can ever forget his first day's shooting? —his feelings of mingled anxiety and alarm as he clumsily balanced his shot-gun on the broken limb of some accommodating tree, doubting even in that ecstatic moment whether himself or his *game* is to be "knocked down" first; or the thrill of delight which passes through his whole frame as he pulls the fatal trigger, and consigns to an ornithological heaven the immortal part of some jaunty little wren shaking herself on a neighboring fence-rail, or some red-headed woodpecker tapping a hollow beech-tree. Who can ever forget his feelings of exultation as he folded the quivering limbs of his prize in his jacket pocket, and in a loud voice informed his companions that he had "bagged his *game*"! Who can ever forget the proud step with which, upon his return home, he has invaded the dreaded precincts of the kitchen,—until that moment as sacred as the dragon-watched garden of the Hesperides,—or the majestic tones in which he has ordered its aproned guardian to serve the *game* — *i. e.*, one wren, one woodpecker (red-headed), one ground-squirrel, and a sparrow (a record of whose death, he presumes from his early reading of Scripture, has been marked to his account above) — for supper, *precisely at 7 o'clock!* Who can ever forget the minute details which he has given of this, his first day's shooting, to the family as a "grace" to the meal which his mighty arm has provided

for them! How eloquently he has described his long race after the ground-squirrel, before he could get it to *stand still*; how Joe headed it off, while he, the "crack shot" of the party, by unanimous vote was selected executioner! How "Papa" has facetiously cautioned him against mistaking a "pea-chicken" for a partridge, and his indignant disclaimer of such ignorance, while "Mamma" is carefully rubbing, with flannel soaked in whiskey, the "black and blue" marks on his right arm just below the shoulder, and "Bessie" is listening with the greatest interest to the recital of his hair-breadth escapes and wonderful adventures, which in her estimation place him at once in the front rank of heroes, both ancient and modern, not excepting William Wallace and General Washington! Then how Bessie slips off to the next cottage to communicate to her little friend (our hero's sweetheart), with many interjectional "oh's" and "ah's" and "dear me's," the full history of his exploits, and to promise for him that the second "fruits" of his prowess shall be sacrificed to *her*, the first, as in duty bound, being offered to the "Lares!"

Have you forgotten these childish incidents? If so I pity you; for myself I would not exchange this recollection of *my* first day's shooting, for all the "fish, flesh, and fowl" that I have since murdered, according to the most scientific principles. Think of the daily petitions to Papa asking a double-barreled gun, as the reward for "worlds of study" *in futuro*! Think of the anxious fears of Mamma, quieted by knocking over a bluebird sitting on the porch-rail just at her elbow: the maternal exhortations, and the dainty lunch to preserve the life and stay the stomach of the adventurous young "Nimrod"! Think of the daily hydropathic treatment which the "double-barreled" is subjected to—drenched with warm and cold water, and swathed in sheets and blankets! Think of the absorbing interest with which the *Forest and Stream* was devoured! Think of the topographical explorations of the surrounding country in search of a blackbird's nest! Think of the snowy owl shot one winter day on the sand-hills back of the beach, and which "Papa"

(cruel man) said shouldn't be eaten—now ornamenting the most conspicuous place in the bedroom, and regarded with as much pride by its conqueror, as the Indian would feel at his scalp-girdle! Think of the many "trophies" that adorn the *cidevant* chicken-house, now called a shooting-box—the *white* blackbird, shot in Farmer Hedgerow's meadow; the *yallar* partridge that Joe *shot on the wing*, because its wings had been *shot off* by some less enterprising predecessor; the *black* woodcock that *was* shot on the wing, as all the neighbors knew, and whose fate worked so great a change in the destiny of the humbler classes of the feathered tribe that had previously (only out of compliment to their "unhandsome corses") been styled game!

All this, and much more, who does not recollect? I do; and in thus imperfectly describing those early impressions, I tell the story of yours and my "first day's shooting."

Noticeable Articles.

THE *Fortnightly* for November contains a paper by that vigorous writer, Mr. W. S. Lilly, on a subject which cannot fail, sooner or later, to come before the mind of every student of science whose studies carry him at all below the surface of things—the subject, indeed, which underlies all the deeper controversies of the day. It is entitled "Materialism and Morality," and in it the writer, taking three eminent men as typical representatives of the modern scientific spirit, namely, Prof. Huxley, Herbert Spencer, and that remarkable man, the late Prof. Clifford, proceeds to analyze their doctrines as purely materialistic. He quotes from Prof. Huxley, "Consciousness is a function of nervous matter, when that nervous matter has attained a certain degree of organization;" "We shall, sooner or later, arrive at a mechanical equivalent of consciousness just as we have arrived at a mechanical equivalent of heat:" "The progress of science has in all ages meant, and now more than ever means, the extension of the province of what we call matter and causation, and the concomitant gradual banishment from all regions of human thought of what we call spirit and spontaneity;" and he quotes to the same effect from

Spencer and Clifford. To be sure, there are many passages in Spencer which look the other way: "I think, however," says Mr. Lilly, "that if we closely examine his writings, we shall find the persistence of force his one formula. With that he will bring for you life out of the non-living, morality out of the unethical, the spiritual out of the physical."

Against all this Mr. Lilly presents himself as the champion of the opposing doctrines, and he draws out the difference between the two systems very clearly in a single paragraph: "It will be found in the long run that there are two and only two great schools of thought; two schools which, in common with the philosophical writers of Germany, France, and Italy, I shall denominate Spiritualism ('in spite,' he says, 'of the abuse of that word by vulgar charlatans') and Materialism, until better terms are forthcoming. Spiritualism seeks the explanation of the universe from within, and, with Kant, holds it as a fundamental truth that the nature of our thinking being imposes one way of conceiving, of valuing, and even of apprehending, invisible things. Materialism maintains that in these sensible things must be sought the explanation of our ideas and our wills. Spiritualism postulates a First Cause possessing absolute freedom, and recognizes true causality in man also, with his endowment of limited and conditioned liberty of will. Materialism holds that we can know nothing before the proximate and determining causes of phenomena, and demands, in the words of Mr. Huxley, "the banishment from all regions of thought of what we call spirit and spontaneity." Spiritualism insists upon the unity of consciousness—upon consciousness of personal identity—as the original and ultimate fact of man's existence. Materialism dissolves the *ego* into a collection of sensations, makes of consciousness an accidental and superficial effect of mechanism, and exhibits man a mere sequence of action and reaction. Spiritualism maintains the absolute nature of ethics, the immutable distinction between moral good and evil; Materialism refers everything to heredity, temperament, environment, convention.

He says that Mr. Herbert Spencer resolves moral obligation into "a long-sighted selfishness, its sanction into a brain-track;" while Mr. Taine calls virtue and vice "merely products, like sugar and vitriol." To this he opposes the following from Kant: "Will is a kind of causality, belonging to living beings in so far as they are rational; and freedom

is such a property of causality as enables them to be efficient agents independently of outside causes determining them; while, on the other hand, necessity is that property of all irrational beings which consists in their being determined to activity by the influence of outside causes." This conception of human freedom, says Mr. Lilly, underlies the notion of crime. The sense of crime is bound up with the belief in man's power of choice, and in his obligation to choose rightly.

This brief abstract gives but little idea of the abundance of illustration which characterizes the paper. But Prof. Huxley found himself by no means satisfied with the writer's exposition of his opinions, and in a characteristically vivacious article in the next number he gives his reply. He even complains that Mr. Lilly attributes to him ideas which he has been all his life opposing; and he makes it abundantly evident that he is no adherent of that gross form of materialism represented by Büchner's "Kraft und Stoff," the doctrine "that there is nothing in the universe but matter and force, and that all the phenomena of nature are explicable by deduction from properties assignable to these two primitive factors." "It seems to me pretty plain," he says, "that there is a third thing in the universe, to wit, consciousness, which I cannot see to be matter or force, or any conceivable modification of either, however intimately the manifestations of the phenomena of consciousness may be connected with the phenomena known as matter or force." Elsewhere, he says that no one doubts that consciousness, *in certain forms, at any rate*, is a cerebral function, implying that human consciousness is *not* wholly dependent on the material brain so as to perish with it. But, in spite of this admission, he at once proceeds to declare himself, in regard to the opposite doctrine, an entire "agnostic," a knowing nothing, and as purely a "determinist," that is to say, a fatalist, as the most out-and-out believer in nothing but matter and force. An acute writer in the *London Spectator* for December 4th, taking the other side very vigorously, winds up the controversy by pointing out Prof. Huxley's inconsistencies. He is much too clear a thinker to be satisfied with the gross materialism of such men as Büchner, but he fails to see that when he admits that he cannot prove that all forms of consciousness are functions of the brain, he knocks the whole foundation of materialism away.

The present writer need hardly say that, so far as there is a real difference, he is all on the side of Kant, and the advocates of free-will and human responsibility. Doubtless it is true that men will never cease to

"Reason high
Of providence, foreknowledge, will and fate"

because, the problems being infinite, can never be wholly solved by finite minds. But is it equally true that the disputants are always "in wandering mazes lost"? With all deference to Milton, it is not so. Philosophy is a progressive science as much as any other; indeed, the science of sciences, because the foundation of all others. What is needed is not the abolition of metaphysics, but a deeper metaphysics. "A wider metaphysic would not harm our physic, is an abundantly true warning. Equally true is it that a wider physic would not harm our metaphysic." Nothing is more striking than the higher plane on which such controversies are now carried. No one would confound such writers as Huxley and Spencer with the crude and gross materialists of the French Revolution. And, after all, is it not with many of the combatants the story over again of the knights of the gold and silver shield?

I trust that this abstruse subject will have a real interest for some of the readers of the TECH.

W. P. A.

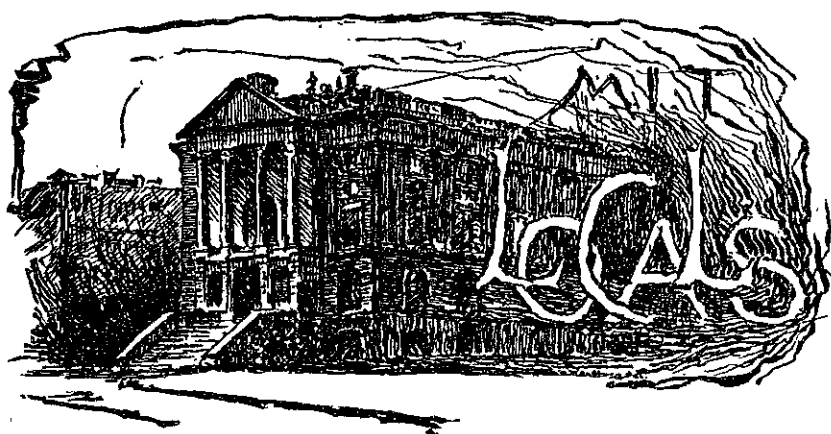
P. S.—I have no one to blame but myself and my own bad hand-writing for what the printer in the last and some preceding articles has occasionally made me say; but really I did not write of Swinburne that "since Byron, there has not been such a mixture of mind and force." I cannot now recollect what I did write; perhaps it was *mud*, to express the mixture of vulgar licentiousness and impudent defiance of all right feeling with real genius in both those poets.

'87's Greeting to 1887.

THE society of '87 met at Parker's New Year's eve, to see out the Old Year and to give '87 a hearty welcome. Over fifty members, including many who have left the Institute, were

present, and were determined to enjoy the evening without thought of cares and studies. To say that all enjoyed the evening, is not expressive enough of the pleasure of the occasion. After a short business meeting lunch was served, and the punch-bowls set forth. When due justice had been done to the repast, President Sears announced as toastmaster Mr. T. D. Brainerd, who most happily filled that position. The first toast, "'87, the New Year," was responded to very aptly by Mr. Draper. "The future" was brightly outlined by Mr. A. L. Cushing. THE TECH received good treatment from Quintard Peters, and "Athletics" were responded to by Mr. Loewenthal, who handled his "points" well. Mr. Spaulding answered for his departed glory, "whiskers"; and to the last toast, "Punch," Mr. Sears gave a spirited reply. The President read a congratulatory telegram from ex-President Archer Corns, and a letter from F. C. Todd. Ex-President Frank Shepard made a brief address. Mr. Brace read a well-written history, and Quintard Peters read a prophecy of the fates of the members one year hence, which contained many telling hits. Timothy Sprague brought down the house with the comical song, "An Awful Little Scrub"; and Mr. Sears read a poem upon the death of the Old Year. At twelve o'clock, to the second, hearty cheers rang out for 1887, and toasts were drunk to the New Year, mingled with songs. When quiet was resumed, Mr. Spaulding told a weird story of the Technology ghost. An impromptu minstrel performance was then most successfully carried out, with Mr. Spaulding as interlocutor, and Messrs. Cobb and W. R. Thomas as end-men; the features of which were Mr. Taintor's original song, written for the occasion, and his amusing story of the man and his wife from down in Maine.

The music during the evening was well rendered by a double quartette, under the leadership of Fred. Thompson. At an early hour in the morning the eventful meeting came to an end, and all reluctantly left the hotel for their homes, singing, "Here's to '87, drink her down."



President Walker's report has appeared.

Well, how did you get through to-day?

Professor Richards has left for Bermuda, where he will stay until he recovers his usual health.

Of '87's "Technique" board only three editors are now at the Institute.

Mr. Henry Souther, '87, is rapidly recovering from his recent illness.

The Chicago Alumni Association of the M. I. T. has perfected its organization.

Professor Jameson has been confined at home from a severe illness for about three weeks.

The Sunday Herald of January 2d gave a very complimentary editorial review of "Technique."

At a recent meeting of the Athletic Club it was voted to give \$100 to the Foot-Ball Association.

W. B. Douglas, '87, of Middletown, Conn., has been in the city lately, meeting his friends at the Institute.

C. M. Wilder, '86, is experimenting upon lighting the Boston & Albany cars by electricity from storage batteries.

Mr. Alexander R. McKim, '85, Ex-President of the Board of Directors of THE TECH, is at present traveling in Europe.

On January 8th the electricals visited Harrison Square, to inspect the interlocking switch signals in use there.

At a recent meeting of the 2 G Society, Messrs. Ray, '88, Gaines, '88, and Beaman, '88, were initiated.

Professor Sedgwick was elected treasurer of the American Natural History Society, at its recent meeting in Philadelphia.

The '89 men are very considerate in wearing bows of orange and black; they can now be distinguished from the Freshmen.

An unfortunate error in "Technique" was the omission of Mr. William M. Rickoff's name from the list of members of Theta Xi.

The Hammer and Tongs held its monthly dinner at Young's, Saturday night; Mr. A. E. Jones, '87, has become a member of the club.

The 2G. held its regular meeting January 5th. Interesting papers on subjects relating to mining were read by several members.

Should Col. Ingersoll visit the mining laboratory during one of the night runs, he would probably change his views about the hereafter.

Elwood J. Wilson, '86, has been appointed an instructor in the analytical laboratory, and has entered upon his duties.

Mr. John Blodgett, '88, has left the Institute to accept a position on the Atchison, Topeka & Santa Fé Railroad, at Kingman, Kan.

Mr. J. W. Cartwright, '89, has been elected treasurer of the K₂S Society, to fill the vacancy caused by the resignation of Mr. Jordan, '88.

The C. B. A. Society saw in the New Year at Young's. Several former members were present, and assisted the active members in seeing in the New Year with full *éclat*.

A trip to South Framingham and Fitchburg was made by the Senior Electricals on January 1st, to examine the electric railway signals on the Boston & Albany and Fitchburg Railroads.

A large number of copies of '87's "Technique" were left over from last year. Any one wishing to complete the set can obtain copies at the TECH office, for twenty-five cents apiece.

Mr. Wilcox, '87, read an essay on the treatment of zincy silver ore before the Senior miners, on January 8th, and Mr. G. Whitney discussed the working of low-grade copper ores.

"Technique" of this year has been most favorably criticised by all outsiders. Besides an editorial notice in the *Herald*, an editorial appeared in the *Transcript* of January 5th, which speaks of it in the highest terms of praise.

At the last meeting of the society of '87, Miss Annie W. Sabine, M.A., was elected an honorary member. Messrs. Fox, Brace, and Burgess constitute the committee to present the new member with a society pin and photograph.

A neat piece of photographic work was the insertion of Duane's picture in the foot-ball group. It is so well done that it is almost impossible to tell that it is inserted. The photographs are now ready at Hastings'.

The class of '74 sat down at Young's, December 28th, to its fifteenth annual dinner. The election of officers for the ensuing year resulted in the election of Mr. G. F. Haynes, of Waltham, as president, and Mr. C. F. Read, of Boston, as secretary.

At Columbia there is an assembly-room, where the students meet between recitations, and talk, smoke, and eat lunches. Such a room at the Institute would be a great convenience, and would allow the reading-room to become a place where some studying can be done.

The following communication was received from the architectural department:—

"Editor of the TECH: Will you kindly inform me when the janitor of the new building bought the Institute, and what was the consideration? CONSTANT READER."

The Freshman Drill went off most successfully last Saturday. The battalion did itself great credit, and will undoubtedly by the end of the year be as good as its predecessors, which is saying a good deal. After the drill the floor was given up to dancing, which continued until six o'clock.

The Architectural Society met on the evening of January 1st in the Rogers reading-room,

and listened to an interesting lecture by Prof. Clark, on Modern European Architecture. The lecture was illustrated with many views, projected on the screen by the stereopticon operator Mr. Henry F. Bigelow.

Mr. Selwin L. Harding, of the class of '88, died last week at his home in Cambridge, of acute peritonitis. He had been ill but a few days. Mr. Harding was a graduate of Harvard University, receiving his degree with the class of '86, and although at the Institute but a short time, had already won the highest opinions of both students and professors, who feel his loss most keenly.

The law of Action and Re-action has again been strikingly illustrated. A certain bold Sophomore who made himself conspicuous in the cane-snatching following the rush, appeared at the Institute after Christmas, the proud possessor of a new cane. One aggrieved Freshman, seeing his opportunity for retaliation, forthwith made himself the possessor of the cane. Great was the lamentation of the Sophomore.

The Glee Club has been rehearsing regularly through the term under the direction of Prof. Pigon, and has sung at Mrs. Roger's and at the President's receptions, adding to the pleasure of those entertainments. Those, however, were mere incidental appearances, and the club will make its first formal appearance at a concert to be given in the latter part of February. Tickets will be on sale this week, and can be obtained from any member of the club.

The Class of '85, which was well known for its enterprise during its course at the Institute, has just issued a class Annual, containing news of its scattered, together with many bright sketches and interesting stories. The book was edited by Messrs. I. W. Litchfield, Charles R. Richards, and Arthur D. Little, and many of the illustrations were drawn by Mr. Josiah Pierce, Jr. Messrs. Little and Litchfield were formerly editor-in-chief and business manager, respectively, of the TECH.

Co-operative Society.

THE Directors of the Co-operative Society are pleased to announce to the students that they have taken under consideration the formation of a book exchange, and have made definite plans and arrangements for it, so that at the commencement of next term, it is expected that it will be in good running order. Owing to the fact that there is a great lack of room at the Institute, so that the Directors have found it impossible to obtain space for the Exchange in the Institute building, they have hired Messrs. C. M. and J. W. Cox, on Clarendon Street, as their agents to receive, store, and sell, books for the members of the Society.

On and after January 17th, any member who wishes to sell text-books, drawing-boards, T squares, instruments or triangles, can take them to the Society's agents, who will give a receipt for each book or drawing article. These will be on sale at agent's store to any member of the Society, at prices a schedule of which will be posted on the East bulletin board in Roger's, and also at Cox's. As soon as a book is sold, notice will be sent to the owner, who on application and presentation of his coupon receipt, will receive from the agents the scheduled price *less 10 per cent*, which will be the agent's commission for selling the same; if the book is not sold the owner can at any time withdraw it from the Exchange, and all books and drawing-instruments must be withdrawn by June 15th, they otherwise becoming the property of the Society.

If on the schedule of prices any book used at the Institute has been omitted, it may be deposited in the Exchange at the owner's price. It will be noticed that no charge for handling the books is made by the Society except enough to pay the agent's commission. The Exchange will be open for members of the Co-operative Society only, and it is hoped that any student who is not now a member, will join at once in order to derive the advantages of the Exchange, as well as those of the generous discounts of the affiliated tradesmen.



The Tuftonian presents a very carefully prepared Christmas number. The cover is particularly striking. "The Old Wizard" is by all odds the best-written paper that has appeared in its columns in a long time. "I Will Repay" and "Body and Soul" are also very readable articles.

The Columbia Spectator's last number is more than usually attractive, which is saying a good deal. It contains a number of good cuts, among which is "A Rapid Departure," representing the four classes, dressed in appropriate costumes, on as many toboggans, in rapid transit by moonlight. The cut is very well executed.

The Yale Record is an exchange which we read with no little interest. Its editorial department is the strongest feature in the paper, although the "Owlisms" are particularly bright and witty, and the literary department able.

The *W. T. I.* of Worcester Institute might, without injury to the paper, extend its literary and College news departments. The last number presents a very good editorial department.

Student Life, of Washington University, is very original and spicy. Its editorial department is in the center of the paper, and occupies two pages of closely printed matter on questions which must be of vital interest to the Washington University students. Its college news is very short, but the exchange editor shows both taste and ability in the manner in which he conducts "Our Table."

The last number of the *Lehigh Burr* makes the statement that itself and the *Columbia Spectator* are the only college papers that are illustrated as a regular thing. THE TECH, it

says, occasionally has an illustration, but this is at intervals. Now, we do not claim to be a regularly illustrated paper, but we do claim to be illustrated as frequently, and more so, than the *Burr*. If the *Burr* has any of our issues of last year, we would like its exchange editor to look them over and see if they are not illustrated, all but one. Our first issue of this year had no illustration. We have been unable to discover any in the October number of the *Burr*. In conclusion, we would like to ask the editor of the *Burr* if he ever heard of the *Harvard Lampoon*?

THE COLLEGE WORLD.

HARVARD.—Nichols, '86, is studying at the Medical School, and will probably play on the nine in the out-field next spring.—The afternoon chapel exercises are very successful, and it is now more than likely that during the winter, at least, the daily exercises will be held in the afternoon instead of the morning. Professors Lowell and Torrey have been placed on the retired list.—The University boat-crew will begin rowing in the gymnasium at once.—The long vacation came to an end January 3d.—The rumor that several freshmen had been expelled from college before Christmas, is entirely groundless.

YALE.—The *Banner* cost seventy-five cents. It contains an unusually large and carefully prepared lot of statistics.—There is a plan afloat at Yale to build a tank large enough to contain a stationary shell, in which the crew can get practice in rowing on water during the winter months.—Gen. George B. Carrington, of Boston, has presented the college library with the original manuscript of an address delivered by Rev. James Beebe, of the class of 1745, to the soldiers he was leading to Canada in the French and Indian War (*Brunonian*).

PRINCETON.—It is stated that the Princeton Faculty have under consideration the advisability of changing Princeton College into a uni-

versity, after the fashion set by Yale. One of the strongest arguments in its favor is the extreme ease with which it can be accomplished (*Ex.*)—The college has been presented by the class of '76 with \$1,000, the interest of which is to be devoted to a prize debate.—Cook, of '89, has been elected captain of the eleven for the coming year.

THE UNIVERSITY OF GEORGIA was the first college to issue an annual publication.

Dr. Nicholas Butler, of Columbia, is to have the charge of a supplement to *Science*, appearing every fourth number, and devoted to the education of pedagogics.—*Pennsylvanian*.

The *Niagara Index* seems to be a target at which every college editor in the land is having a shot. The *Exchange* editor is the bull's eye. Would it be a mixed metaphor to say that the bull's eye has a forked tongue?—*Ex.*

THE *Spirit of the Times* offers a prize of one year's subscription to any one who will satisfactorily explain the resolutions adopted at the Inter-collegiate Foot-ball Convention.

After a lapse of over twelve years, women have again been admitted to the Medical College of Edinburgh.

OBERLIN COLLEGE.—Physical exercise is required of the co-eds.

By the recent base-ball rules, when a batsman takes his base on balls, he is to be credited with a base-hit. The same rule in college would give a man a perfect mark, when an instructor forgets to ask him a question.—*Lowell Courier*.

THE *Columbiad*, published by the Junior class at Columbia College, will soon be ready for sale. A more than ordinarily fine number is expected.

Twenty fellowships are annually given by Johns Hopkins University to graduates of the University, or others, who expect to devote their lives to special branches of learning.

There are one hundred and four college graduates in the House of Representatives.



THE STRANGER SAW THE POINT.

On one of the recent cold nights, a man was hastening across the Common with his overcoat buttoned up to his neck. He was rather anxious to know what time it was, but he was too lazy to unbutton his coat in order to get at his watch. Just then he saw a man of well-dressed appearance coming in the distance, and remarked to himself:—

"Go to! I will e'en ask yon genteel stranger what time it is, and he will unbutton his coat, pull out his watch, and eke inform me of the hour of the night."

He perceived that the stranger was buttoned up just as he was. When he came up, the man who wanted to know the time touched his hat politely and said:—

"Sir, do you know what time it is?"

The stranger paused, removed his right glove, unbuttoned his coat from top to bottom, unbuttoned his under coat, and finally pulled out his watch, while the cold wind beat against his unprotected chest.

Holding up the watch so that the light would shine on it, he scrutinized it an instant, and said:—

"Yes!"

And then he passed on without another word.

—*Boston Record.*

Prof.: "You shouldn't yoke the horse and the ass together; it doesn't make a good team." Student unconsciously thinks of the many times he has been with his "horse," but isn't quite sure of the truth of the statement.—*Yale Record.*

A lady calling herself Silva Dolaro is singing in opera. That certainly is a taking name. In spite of its short-comings, the Silva Dolaro will always be popular with the masses.—*Life.*

LEARNING A TRADE.

Blacksmith (to young man): "You think you possess the necessary qualifications for a blacksmith?"

Young man: "Yes, sir; I was a member of the foot-ball team at college."

Blacksmith (dubiously): "You may be strong enough, young man, but the business demands brains as well as strength.—*Life.*

An absent-minded husband who hadn't been to church for a long time, reached for his hat as the choir ceased singing, and a momentary lull took place, when his wife whispered:—

"What are you doing, John?"

"I'm just going out to see a man," he said.

—*Puck.*

Speaking of diamonds, we have seen the time when the Kohinoor would look dim and lusterless along side of the ace.—*Life.*

THE WAGER.

I took her out to see the game,

A pretty blooming Miss;

She wished to bet, and so I made

A bet about like this:

She bet we'd lose; I bet we'd win;

She didn't like to put up "tin,"

So I, accomodatingly,

Proposed we bet a kiss.

She blushed, and then agreed, because

I'd surely lose, she said;

And I discreetly held my peace,

And wisely shook my head—

For well I knew the pleasant fact

That when the game was done,

Then if I lost, or if I won,

The bet must still be paid.

—*Yale Record.*

MY CHRISTMAS-CARD.

A dainty bit of satin,

A pencil poised in air,

A pretty face upturned,

A faint smile playing there.

"A design for my card," quoth she,

"Something sweet and rare;

A bit of art with meaning,

Exquisite, *débonnaire*."

I seized the pencil quickly,

And drew, with reverend care,

The face I saw before me,

The sweetest, rarest there.

—*Yale Record.*

DRESS SHIRTS,

For Weddings, for Receptions, for Dinner Parties, with Collars, Cuffs, and Cravats, in the latest English styles.

Plain French Bosoms,

Fine Spots, Plaits and Cords.

Jurors' award for beauty of workmanship and design, and distinguished excellence in the manufacture of shirts.

NOYES BROS.,

Washington and Summer Streets,
BOSTON, U. S. A.

BLANKET WRAPS

For Men, Women, and Children, for the House, the Bath, or the Sick-Room. Those having occasion to be up nights will find them indispensable.
\$3.75 to \$75.00.

Lambs' Wool Abdominal Bands, a positive cure for all Bowel Troubles, Ladies' and Men's, at Noyes Bros.'

Underwear and Hosiery in Pure Silk, Lambs' Wool, Merino, Balbriggan, and English Cotton, for early fall wear, at Noyes Bros.'

English Flannel Pajamas, Long Flannel Night Shirts and Wraps, for steamer and railway traveling, at Noyes Bros.'

Dress Shirts, with the New French Cords, Spots, and Fine Plaited Bosoms, elegantly made by Messrs. Noyes Bros.'

English Mackintosh Coats for Ladies and Gentlemen, at Noyes Bros.'

— ENGLISH —

DRESSING GOWNS, JACKETS, AND WRAPS.

English Cheviots,

ENGLISH AND FRENCH FLANNELS,

Silk and Wool, and Pure Silk Shirtings,

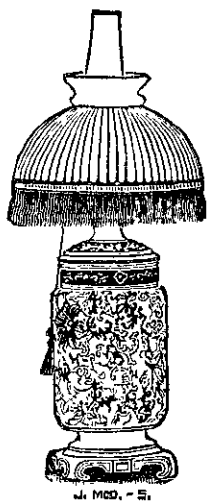
For Lawn Tennis, for Steamer Traveling, for Hunting and Fishing, for Railway and Yachting, always in stock or made to special measure.

ENGLISH NECKWEAR.

London Tan Street Gloves, warranted, \$1.35.

NOYES BROS.,

Washington and Summer Streets,
BOSTON, U. S. A.

**Fine Pottery, Glass, and Lamps.**

THE subscribers invite attention to their stock of the above branches, which we dare say is not excelled on this continent. One of our firm visits the Potteries of England, France, Germany, China, and Japan, seeking the best products from original sources. We have also specimens from the best home manufacturers, comprising desirable exhibits of useful and ornamental wares, to which WE INVITE INSPECTION. Six floors, wholesale and retail.

JONES, McDUFFEE & STRATTON,

120 Franklin Street, corner Federal.

N. B. — Our exhibit of Lamps, Bed-room Sets, Smokers' Sets, and choice Gems in Cut Glass and China for Wedding Gifts, is extraordinary. From the old Wedgwood Pottery we have Plaques, Plates, Mugs, Jugs, Tiles, and Coffees, decorated (under glaze) with Boston scenes (including cut of the Tech Institute), which may be found desirable as souvenirs.

STUDENTS' SUPPLIES.

A FULL LINE OF

Mathematical Goods, Blank Books, Figuring Blocks, Stylographic Pens, etc., and all varieties of Drawing Papers.

Also, the LATEST NOVELTIES in

CHOCOLATES, BON-BONS, and GLACÉ FRUITS.

C. M. & J. W. COX,

Wholesale and Retail Dealers in

Artists' Materials and Fine Stationery,

214 CLARENDON STREET, BOSTON, MASS.

Menus and Orders for Class Suppers and Dances.

HENRY H. TUTTLE & CO.

Would call the attention of Students
to their stock of

Seasonable Foot Wear,

NEW AND NOVEL STYLES,

Some of which are *exclusive with us.*

Prices as low as consistent with
good stock and workmanship.

435 Washington Street,

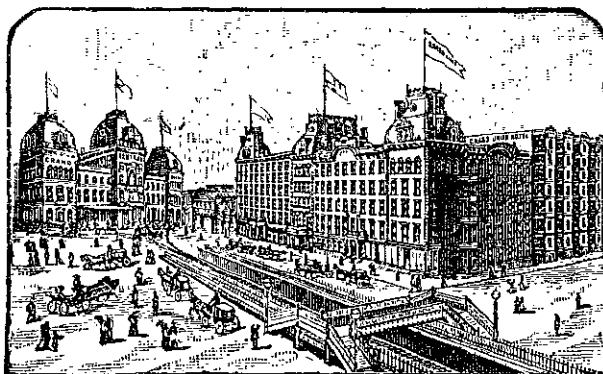
BOSTON.

GRAND UNION HOTEL, NEW YORK CITY.

OPPOSITE GRAND CENTRAL DEPOT.

GUESTS' BAGGAGE TO AND FROM
GRAND CENTRAL DEPOT FREE.

Over 600 handsomely furnished
rooms at \$1.00 per day and upward.
European Plan.



FIRST-CLASS Restaurant, Dining-Rooms, Café, and Lunch Counter, *a la carte*, at moderate prices.

Travelers can live well at the

GRAND UNION

for less money than at any other
first-class hotel in New York.

W. D. GARRISON,
Manager.

NEW ART GALLERIES

79—BOYLSTON ST.—79

WILLIAMS & EVERETT

INVITE ATTENTION TO THEIR EXTENSIVE AND
CAREFULLY SELECTED STOCK OF

PAINTINGS,

FINE ETCHINGS,

RARE ENGRAVINGS, CARBONS,

PHOTOGRAPHS, ETC., ETC.

SPECIAL ATTENTION TO ARTISTIC FRAMING.

OLD PICTURES RESTORED. OLD FRAMES RE-GILT.

79 BOYLSTON ST., BOSTON.

AGENTS FOR ROGERS' GROUPS.

Hardy

PORTRAIT ARTIST.

PHOTOGRAPHER TO THE CLASS OF '87.

ALL UNDERGRADUATE STUDENTS MAY HAVE
PICTURES AT GREATLY REDUCED PRICES.

A. N. HARDY,

493 Washington Street, Boston.

RAYMOND & FOX,

179 TREMONT STREET,

Importers, Jobbers, and Retailers of Fine Cigars.

"He who doth not smoke hath either known no griefs, or refuseth himself the softest consolation
next to that which comes from Heaven."—*Sir Bulwer Lytton.*

Our assortment is at all times complete in Popular Brands.

Our importations are regular, and in such quantities as enable us
at all times to offer to our customers fresh goods.

RAYMOND & FOX.

Thorndike Hair-Dressing Rooms.

A. S. SCHUTZ, Proprietor.

SIX SHAVES FOR NINETY CENTS.

Billiard-Room Connected.

BOSTON FOREIGN BOOK-STORE.

CARL SCHOENHOF.

144 TREMONT STREET, BOSTON.

AMATEUR PHOTO-OUTFITS.

DISCOUNT TO STUDENTS.

Send for lists to

CHANNING R. SELEE,

56 Bromfield Street, Boston.

TOOL DEPOT.

CALL AND EXAMINE THE LARGEST ASSORTMENT

— OF —

MACHINISTS' TOOLS

AND SUPPLIES

To be found in New England.

A. J. WILKINSON & CO.

184 and 188 Washington Street, Boston, Mass.

WALTER C. BROOKS & CO.

TAILORS

6 UNION STREET, BOSTON.

Stock selected Particularly for Young Men's Wear.

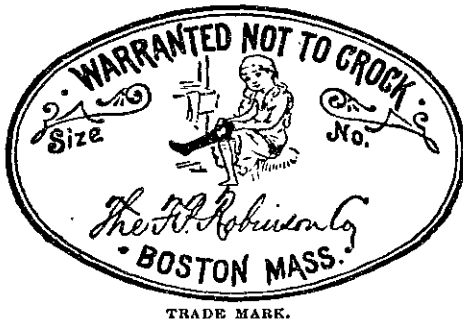
GERLACH & STEUER

(Formerly Jacob Gerlach),

Ladies' and Gents' Hair Cutting.

54 TEMPLE PLACE,
BOSTON.

Manufacturer of Ventilating or
Gossamer wigs and toupees.
Ladies' Hair Work of every va-
riety. Children's Hair cut in the
neatest style.



TRADE MARK.

Black Stockings

Money refunded if they stain the
feet. Every pair stamped with
our warrant.

THE F. P. ROBINSON CO.,

49 West Street, Boston.

FALL RIVER LINE TO NEW YORK

We hope you will
get an



on all the Semies.
How about that?

FALL RIVER LINE TO NEW YORK

D. TOY,

* TAILOR *

-11-

Charles Street,

NEAR BEACON ST.

A large Stock of Foreign and
Domestic Goods always on hand.
Agent for Winchester, Son, &
Flowers, 17 Maddox Street, and
Whitaker & Co., 43 Conduit Street,
London, W

THE ASSOCIATION GYMNASIUM,

Corner Boylston and Berkeley Streets.

R. J. ROBERTS, Superintendent.

H. L. CHADWICK, Assistant Superintendent.

L. F. SMALL, Clerk.

CORPS OF COMPETENT VOLUNTEER INSTRUCTORS.

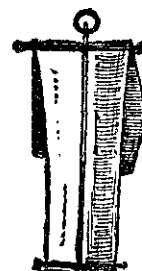
Classes Morning, Afternoon, and Evening.

Special Attention to Members not in Classes.

The newest and most complete Gymnasium in regard to
Apparatus and all other appointments.

Terms, including Box, Measurements, Personal and Class Instruction,
\$8.00 per year; for three months, \$5.00.

Young men purposing to join a Gymnasium are invited to inspect
this Gymnasium thoroughly.



London Trouser-Stretcher.

Takes bagging out of knees and restores
pantaloon to original shape. Price,
\$2.50. AGENTS WANTED. Send
for Circular. The best Present you can
make to any gentleman. Sole Wholesale
Agents in the United States,

G. W. SIMMONS & CO.,

32 North Street, Boston, Mass.

BRUNSWICK HAIR-DRESSING ROOMS

ROBERT LINK, Proprietor.

Six Shaving Tickets for \$1.00.

DAVID MYERS,

TAILOR

175 Tremont St.

*I have a Large and Well-Selected
Stock of ENGLISH CLOTHS for*

BUSINESS SUITS,

DRESS SUITS,

FANCY WAISTCOATS,

TROUSERS, and

OVERCOATS.

Special Prices to Students.

THE
BRUNSWICK

BOSTON'S

Grandest Hotel

BARNES & DUNKLEE,

Proprietors.



NEAR the Public
Garden, Common,
and Public Library,
Museum of Fine Arts,
New Old South, Trin-
ity (Phillips Brooks's)
Church, and OPPO-
SITE INSTITUTE of
TECHNOLOGY.

Beacon, Dartmouth
Street, and Hunting-
ton Avenue, and all
Back Bay Cars, pass
the Hotel for either
up or down town,
every three minutes.

BOSTON MUSEUM.

SIGNAL SUCCESS OF

HELD BY THE ENEMY.

UNTIL FURTHER NOTICE.

R. M. FIELD . . . Manager.

LUX ENGRAVING CO.

OFFICE, 31 EXCHANGE ST., BOSTON.

Designing and Engraving

of every description, for Schools and Colleges, by our new Photo-
Engraving method, and on Wood.

STYLISH NECKWEAR,

COLLARS AND CUFFS FOR YOUNG MEN.

F. W. SEAVEY, - - - 53 WEST STREET.

C. H. CODMAN & CO.

Manufacturers and Wholesale Dealers in every variety of

Photographers' Materials, Dry-Plate Amateur Outfits.

Sole Agents for the New Ortho-
panatic Lens.

34 Bromfield St., Boston, Mass.

Frank Wood,

Printer,

352 Washington Street, Boston.

JOSEPH GILLOTT'S
Steel Pens

JOSEPH GILLOTT & SONS, 91 John Street, New York, HENRY HOE, Sole Agent.

FOR ARTISTIC USE in fine drawing,
Nos. 659 (the celebrated Crowquill), 660 and 661.
FOR FINE WRITING, Nos. 1, and 303 and Ladies', 372.
FOR BROAD WRITING,
Nos. 204, 329 and Stub Point, 248.
FOR GENERAL WRITING, Nos. 330, 404, 330 and 504.
Sold by ALL DEALERS throughout the World.
GOLD MEDAL PARIS EXPOSITION, 1872.

PREPARATION for the INSTITUTE of TECHNOLOGY,
and for HARVARD COLLEGE without Greek.

Private School, 18 Boylston Pl., Boston.

ALBERT HALE.

For 1887. CALENDARS AND DIARIES,
ELEGANT STATIONERY,

THE BIJOU DIRECTORY,
(Beacon Hill, Back Bay, and South End.)

CAPEN'S GEOLOGY OF NEW ENGLAND,
Folio, with superb Colored Illustrations.

For 1887.

C. E. RIDLER, Corner Boylston and Berkeley Sts., Boston.

PRIVATE SCHOOL FOR BOYS,
165 Tremont Street, Boston.

Preparation for College, INSTITUTE OF TECHNOLOGY, and
Business. Thorough instruction given in Elementary
English Studies.

Native French and German Teachers.

LEROY Z. COLLINS.

JOHN EARLE & CO.,

Tailors to the Co-operative Society,

330 WASHINGTON ST., BOSTON.

Dress Suits loaned for occasions:

Note Books and Students' Supplies,

At lowest possible prices.

FRED W. BARRY,

108 and 110 Washington Street, Boston.
Corner of Elm Street.

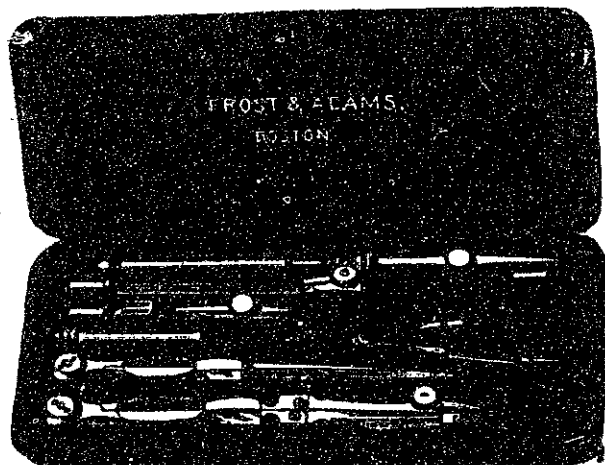
B. W. CURRIER & CO.,

DEALERS IN

Fine Ready-made Clothing

395 WASHINGTON STREET, BOSTON.

F. E. WELLS, Manager.



FROST & ADAMS,

IMPORTERS OF

Drawing Instruments

AND

Supplies for Students, Architects, and Engineers.

Designers' Colors a Specialty.

SEND FOR ILLUSTRATED CATALOGUE.

No. 37 Cornhill, - - - BOSTON.

J. C. LITTLEFIELD,

Chambers,

➤ **FINE TAILORING** ◀

2A Beacon St.

The Latest Novelties of the Season.

DRESS SUITS A SPECIALTY.

HARRINGTON

JOHN R. FARRELL,

≡ **TAILOR** ≡

No. 14 Boylston Hall, Boston, Mass.

Finest line of Foreign and Domestic Fabrics constantly on hand, to be made in the best styles, at reasonable prices.

MILITARY SCHOOL JACKETS, CHEVRONS, and UNIFORMS.